USER INSTRUCTIONS AND INFORMATION FOR

HIGH-PERFORMANCE RIGGING ROPES

Polyester rigging lines are made from high-strength fibers and are durable constructions for handling dynamic loads and resisting abrasion.

IMPORTANT POINTS TO FOLLOW WHEN USING SAMSON RIGGING ROPES:

> Samson recommends that if this product is used in conjunction with other components that they and the "system" be designed in accordance with the European Machinery Regulation.

> Misuse of this product or use with incorrect hardware may cause serious injury.

> When in doubt of condition, the rope should be replaced.

> Rope should be inspected periodically, according to usage, by a competent person authorized by the manufacturer. At minimum, the rope should be inspected every 12 months. This inspection should also include the legibility of all product markings.

> Read all accompanying information provided by the manufacturer.

> Equipment operators should be properly trained on the use of this product and the "system" before commencing operations.

> Rope cut to shorter lengths must be remarked as on the original rope.

> It is essential for the safety of the user that if the product is resold outside the original country of destination, the reseller shall provide instructions for use, for maintenance, and for periodic examination in the language of the country in which the product is to be used.

Records must be kept that detail each use and the results of the inspections. Samson recommends that the records be maintained by the same person who uses the rope.

The record should contain the following information:

- Trademarks: (Stable Braid™, Tenex™, Tenex-TEC™, and Tenex-TEC Pro™,)
- Type of product (polyester rope)
- Serial batch number
- Year of manufacturing
- Purchase date
- Date of first use
- History of product inspections and/or repairs, including the details of the inspection/repair, name and signature of the person who performed the inspection/repair, and the due date for the next inspection
- User name
- Comments

TERMINATING

Samson high-performance rigging ropes should be terminated utilizing a splice or suitable method of achieving the specified minimum breaking load of the product. While knots and hitches reduce rope strength, they can be a convenient way to terminate and attach a rope. The tight bends that occur result in strength loss. It is vital to take into account the reduction in strength by the use of knots and hitches when determining the size and strength of a rope to be used.

EC DECLARATION OF CONFORMITY

Samson polyester rigging ropes fulfill all of the relevant requirements of EC Machinery Regulation 2023/1230/EC. www.*samsonrope.com/user-instructions*

MARKINGS

CE	Indicates rope conforms to EC Machinery Regulation
Product Name	Brand name assigned to product by manufacturer

SAMSON CORPORATE HEADQUARTERS

2090 Thornton Street
Ferndale, WA USA 98248

TEL +1 360.384.4669
FAX +1 360.384.0572

www.SamsonRope.com

PHYSICAL PROPERTIES *For the most up-to-date product specifications, please refer to SamsonRope.com*

STABLE BRAID™ COATED PHYSICAL PROPERTIES

Product Code	Nominal Diameter	Weight Per 100 meters KILOGRAMS	Average Strength* KILOGRAMS	Minimum Strength* KILOGRAMS	ISO 2307 Strength** METRIC TONS	Fiber Type	Specific Gravity	ELASTIC ELONGATION 10%	20%	30%	Splice/Class
806032	**12** mm	12.2 kg	4,700 kg	4,000 kg	4.5 mt	Polyester	1.38	1.1	1.7	2.7	Double Braid CLASS I
806036	**14** mm	16.4 kg	6,000 kg	5,100 kg	5.7 mt						
806040	**16** mm	20.8 kg	7,400 kg	6,300 kg	7.0 mt						
806048	**18** mm	26.8 kg	9,300 kg	7,900 kg	8.7 mt						

TENEX™ PHYSICAL PROPERTIES

Product Code	Nominal Diameter	Weight Per 100 meters KILOGRAMS	Average Strength* KILOGRAMS	Minimum Strength* KILOGRAMS	ISO 2307 Strength** METRIC TONS	Fiber Type	Specific Gravity	ELASTIC ELONGATION 10%	20%	30%	Splice/Class
826032	**12** mm	11.9 kg	5,700 kg	5,100 kg	5.7 mt	Polyester	1.38	1.4	2.3	3.0	12 Strand CLASS I
826036	**14** mm	14.9 kg	6,500 kg	5,900 kg	6.5 mt						
826040	**16** mm	17.9 kg	8,400 kg	7,600 kg	8.4 mt						
826048	**18** mm	25.6 kg	11,100 kg	10,000 kg	11.1 mt						

TENEX-TEC™ PHYSICAL PROPERTIES

Product Code	Nominal Diameter	Weight Per 100 meters KILOGRAMS	Average Strength* KILOGRAMS	Minimum Strength* KILOGRAMS	ISO 2307 Strength** METRIC TONS	Fiber Type	Specific Gravity	ELASTIC ELONGATION 10%	20%	30%	Splice/Class
825032	**12** mm	13.7 kg	5,900 kg	5,300 kg	5.9 mt	Polyester	1.38	1.4	2.3	3.0	12 Strand CLASS I
825040	**16** mm	22.0 kg	8,500 kg	7,700 kg	8.5 mt						
825048	**18** mm	26.3 kg	11,200 kg	10,100 kg	11.2 mt						
825056	**22** mm	39.7 kg	15,500 kg	14,000 kg	15.5 mt						
825064	**24** mm	51.6 kg	20,200 kg	18,200 kg	20.2 mt						

TENEX-TEC PRO™ PHYSICAL PROPERTIES

Product Code	Nominal Diameter	Weight Per 100 meters KILOGRAMS	Average Strength* KILOGRAMS	Minimum Strength* KILOGRAMS	ISO 2307 Strength** METRIC TONS	Fiber Type	Specific Gravity	ELASTIC ELONGATION 10%	20%	30%	Splice/Class
716032	**12** mm	13.5 kg	7,400 kg	6,600 kg	7.4 mt	Polyester	1.38	1.6	3.2	4.8	12 Strand CLASS I
716040	**16** mm	20.2 kg	10,500 kg	9,400 kg	10.5 mt						
716048	**18** mm	26.3 kg	13,200 kg	11,800 kg	13.2 mt						

**Spliced strength. **ISO strength specifications are for unspliced rope.*

STANDARDS FOR STRENGTH AND USAGE

WORKING LOADS

The working load limit (WLL) is the maximum static load the rope is designed to sustain during normal use.

DANGER TO PERSONNEL

Persons should be warned against the serious dangers of standing in line with a rope under tension or standing near suspended loads. Should the rope part, it may drop a payload or recoil with considerable force. In all cases where any such risks are present, or where there is any question about the load involved or the condition of use, the working load should be substantially reduced and the rope properly inspected before every use, or the rope should be replaced.

ROPE INSPECTION

Do not use rope showing signs of aging and wear as described herein. If in doubt, destroy the used rope. No type of visual inspection can be guaranteed to accurately and precisely determine the actual residual strength. When the fibers show wear in any given area, the rope should be replaced. For more details, see the Rope Retirement and Inspection section which follows.

AVOID ALL ABRASIVE CONDITIONS

All rope will be severely damaged if subjected to rough surfaces or sharp edges. Pulleys, sheaves and other rope contact surfaces must be kept in good condition and free of burrs, corrosion and rust. Pulleys must be free to rotate and should be of proper size to avoid excessive wear. Avoid any sharp or rough edges that the rope may come into contact with.

AVOID CHEMICAL EXPOSURE

Every rope is subject to damage by chemicals. Consult the manufacturer for specific chemical exposure, such as solvents, acids, and alkalis. Consult the manufacturer for recommendations when a rope will be used where chemical exposure (either fumes or actual contact) can occur.

AVOID ELEVATED TEMPERATURES

The critical and melting temperature for polyester fiber is listed below:

	TEMPERATURE	
FIBER TYPE	CRITICAL	MELTING
POLYESTER	177° C 350° F	249-260° C 480-500° F

Heat can seriously affect the strength of synthetic ropes, even when not in operation. If rope is subjected to temperatures exceeding this critical temperature for extended periods, the rope should be replaced.

Polyester ropes shall not be used in contact with objects or at temperatures in access of 194°F (90°C) or at temperatures below -40°F (-40°C).

High temperatures can be achieved when rope is allowed to run over a friction surface, such as in a static sheave. Each rope's construction and fiber type will yield a different coefficient of friction (reluctance to slip) in a new and used state. It is important to understand the operational demands and insure the size, rope construction and fiber type be taken into account to minimize heat buildup. Never let ropes under tension rub together or move relative to one another. A particularly dangerous situation can develop when a moving rope under tension rubs over a stationary rope (note that "rope" can be any synthetic load-bearing component, such as webbing). Enough heat to melt the fibers can quickly build up and cause the rope to fail. Always be aware of areas of heat buildup and take steps to minimize it; under no circumstances should rope come in contact with an exhaust muffler or any other hot object.

STORAGE

All rope should be stored in an area that is cool, clean, dry, out of direct sunlight, well-ventilated, and away from any heat sources. The use of rope for any purpose subjects it to friction, bending and tension. All rope hardware, pulleys, and hoists are, in varying degrees, damaging to the rope. It is important to understand that rope is a moving, working, strength member and even under the most ideal conditions will lose strength during use in any application. Maximizing the safety of rope performance is directly related to how strength loss is managed and making sure ropes are retired from service before they can create a dangerous situation. Ropes are serious working tools and used properly will give consistent and reliable service. The cost of replacing a rope is extremely small when compared to the physical damage or personnel injury a worn out rope can cause. When transporting, the same care should be taken.

ROPE LIFE FACTORS

There are basically three steps to consider in providing the longest possible service life, the best conditions and long-range economy for ropes: **Selection, Usage, and Retirement.**

SELECTION
Select the right rope for the job in the first place.

Selecting a rope involves evaluating a combination of factors. Some of these factors are straightforward, like comparing rope specifications. Others are less qualitative like a preference for a specific color or how a rope feels in your hand. Cutting corners, reducing application factors, sizes or strengths on an initial purchase creates unnecessary replacements, potentially dangerous conditions and increases long term costs. Fiber and construction being equal, a larger rope will outlast a smaller rope because of the greater surface wear distribution. By the same token, a stronger rope will outlast a weaker one because it will be used at a lower percentage of its break strength with less chance of over stressing.

STRENGTH

When given a choice between ropes, select the appropriate size for a given application. A load of 5 kN represents 2% of the strength of a rope with a breaking strength of 250 kN. The same load represents 4% of the strength of a rope that has a breaking strength of 125 kN. The weaker rope experiences greater strain and as a result will have to be retired sooner.

ELONGATION

When considering rope elongation properties, care should be taken to ensure the selected product is fit-for-purpose. Ropes with higher elastic elongation are typically used to provide a form of energy absorption in a system, while ropes with relatively low elongation provide increased position control and less stored energy at a given load.

ROPE INSPECTION AND RETIREMENT

USAGE
Use rope properly; do not abuse or shock load it, observe recommended usage factors for bending and work loads. Keep ropes clean and eliminate abrasion contacts.

SYSTEM COMPATIBILITY

The performance of rope hardware may be adversely affected by rope construction, condition, diameter, age, and other factors. Hardware in the system must be kept in good working condition to ensure, for example, smooth finish of contact surfaces, rotating components remain free to turn, and sharp edges are not near the rope during operation. It is your responsibility to check before using it that this rope is compatible with the other components of your equipment and their standards. In particular, you must check that the rope hardware is suitable for the diameter of rope being used.

BENDING

Any sharp bend in a rope under load decreases its strength substantially and may cause premature damage and failure. Such sharp bends can occur in knots and hitches or when the rope is run on a drum through a pulley or with other hardware. To retain maximum rope strength, the bend radius should be at least 8 times the rope diameter.

SHOCK LOADS

Shock loads are simply a sudden change in tension from a state of relaxation or low load to one of high load. Any sudden load that exceeds the work load (SWL) by more than 10% is considered a shock load. The further an object falls, the greater the impact. Shock loads increase wear rate and must be avoided.

RETIREMENT
Inspecting your rope should be a continuous process of observation before, during and after each use.

In synthetic fiber ropes the amount of strength loss due to abrasion and/or flexing is directly related to the amount of broken fiber in the rope's cross section. After each use, look and feel along every inch of the rope length inspecting for damage as listed below. Caution: dirt on your rope can conceal damaged areas; it is a good idea to clean excess dirt off the rope prior to inspection.

ABRASION

When a rope is first put into service, the outer filaments of the rope will tend to abrade and fuzz up. This is the result of these filaments breaking, which forms a protective cushion and shield for the fibers underneath. In most applications, this condition should stabilize, not progress. If the surface roughness increases, excessive abrasion takes place and strength is lost. When inspecting the rope, look closely at both the inner and outer fibers. When either is worn, the rope is degrading, and users should reference Samson's Inspection and Retirement tools for additional guidance.

Open the strands and look for powdered fiber, which is one sign of internal wear. Estimate the internal wear to estimate total fiber abrasion. If total fiber loss is 20%, then it is safe to assume that the rope has lost 20% of its strength as a result of abrasion. To determine the extent of fiber damage from abrasion, a single yarn in all abraded areas should be examined. The diameter of the abraded yarn should then be compared to a portion of the same yarn or an adjacent yarn of the same type that has been protected by the strand crossover area and is free from abrasion damage.

GLOSSY OR GLAZED AREAS

Glossy or glazed areas are signs of heat damage with more strength loss than the amount of melted fiber indicates. Fibers adjacent to the melted areas are probably damaged from excessive heat even though they appear normal. It is reasonable to assume that the melted fiber has damaged an equal amount of adjacent unmelted fiber.

INCONSISTENT DIAMETER

Inspect for flat areas, bumps or lumps or areas that are otherwise different in texture, size, or feel from the majority of the rope's surface. This can indicate core or internal damage from overloading or shock loads and is usually sufficient reason to replace the rope.

DISCOLORATION

With use, all ropes get dirty. Be on the lookout for areas of discoloration which could be caused by chemical contamination. Determine the cause of the discoloration and replace the rope if it is brittle or stiff.

ROPE HANDLING

REMOVING ROPE FROM REEL OR COIL

The rope should be removed from the reel by pulling it off the top while the reel is free to rotate. This may be accomplished by passing a broom handle through the holes in the ends of the reel and placing each end of the broom on a chair. Rope should never be taken off a reel by pulling it over the end(s) of the reel. If the rope is supplied in a coil, it should be uncoiled in the same direction it was coiled. To do this, cross your arms through the middle of the coil (arms entering from opposite sides of the coil) and rotate them slowly (one over the other) to uncoil the rope. Do this slowly to avoid tangling. If the end of the rope becomes unwieldy, it may be taped to itself (forming a loop) until uncoiling is complete. Never pull the rope off the coil as this causes kinking.

PREPARING A LENGTH OF ROPE

When removing a new rope from a longer bulk length of rope, it is important to ensure the ends are secured such that the strands do not unbraid after cutting. This can be accomplished by wrapping the section where the cut will be made tightly with tape. A sharp, non-serrated knife blade should be utilized to reduce fiber and strand snagging. Methods for terminating ropes can be found in Samson's Rope Splicing Manual.

MINIMIZE TWIST IN THE LINE

Braided ropes are inherently torque neutral and, therefore, will not induce torque when tension is applied. However, it is important to prevent significant twist from being introduced into the rope by outside factors such as handling, installation, or use in conjunction with a wire rope. Braided ropes that have been twisted can suffer from strength loss and accelerated degradation and therefore twist should be monitored and removed when identified. The impact of twisting braided lines is highly dependent on the twist and the size of the rope. When in doubt, Samson had helpful references at *SamsonRope.com,* or you can contact your Samson representative.

ROPE INSPECTION

Any rope that has been in use for any period of time will show wear and tear. Some characteristics of a used rope will not reduce strength while others will. Below we have defined conditions that should be inspected for on a regular basis.

During your inspection you must consider the following before deciding to repair (when possible), downgrade, or retire your rope:

- the length of the rope,
- the time it has been in service,
- the type of work it does,
- where the damage is, and
- the extent of the damage.

In general, it is recommended that you:

- Repair the rope, when possible, if the damage is limited only to localized areas.
- Retire the rope if the damage covers an extended area, or is localized damage that is significant and not repairable.

TENEX FAMILY *12-strand single braid*	STABLE BRAID *double braid*		
CUT STRANDS REPAIR OR RETIRE			
		**WHAT** > TENEX: Two or more cut strands in proximity > STABLE BRAID: Three or more cut strands in proximity **CAUSE** > Abrasion > Sharp edges and surfaces > Cyclic tension wear	**CORRECTIVE ACTION** *If possible, remove affected section and re-splice with a standard end-for-end splice. If re-splicing is not possible, retire the rope.*
MELTED/GLAZED FIBER REPAIR OR RETIRE			
		**WHAT** > Fused fibers > Visibly charred and melted fibers, yarns, and/or strands > Extreme stiffness > Unchanged by flexing **CAUSE** > Exposure to excessive heat > Shock load > Sustained high load	**CORRECTIVE ACTION** *If possible, remove affected section and re-splice with a standard end-for-end splice. If re-splicing is not possible, retire the rope.*
PULLED STRAND NOT PERMANENT — REPAIR			
		**WHAT** > Strand pulled away from the rest of the rope > Is not cut or otherwise damaged **CAUSE** > Snagging on equipment or surfaces	**CORRECTIVE ACTION** Work back into the rope
COMPRESSION REPAIR			
		**WHAT** > Visible sheen > Stiffness reduced by flexing the rope > Not to be confused with melting **CAUSE** > Fiber molding itself to the contact surface under a radial load	**CORRECTIVE ACTION** Flex the rope to remove compression
DISCOLORATION/DEGRADATION REPAIR OR RETIRE			
		**WHAT** > Fused fibers > Brittle fibers > Stiffness **CAUSE** > Chemical contamination *Common causes of discoloration (grease, paint, etc.) are less serious than true chemical contamination*	**CORRECTIVE ACTION** *If possible, remove affected section and re-splice with a standard end-for-end splice. If re-splicing is not possible, retire the rope.*
INCONSISTENT DIAMETER REPAIR OR RETIRE			
		**WHAT** > Flat areas > Lumps and bumps **CAUSE** > Abrasion from sharp edges and surfaces > Broken internal strands	**CORRECTIVE ACTION** *If possible, remove affected section and re-splice with a standard end-for-end splice. If re-splicing is not possible, retire the rope.*
ABRASION REPAIR OR RETIRE			
		**WHAT** > Broken filaments and yarns **CAUSE** > Broken internal strands/core > Pulled strands/compression	**CORRECTIVE ACTION** Consult abrasion reference images in the Samson's *Rope User Manual* and rate internal/external abrasion level of rope. Evaluate rope based on its most damaged section.